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(71) Applicant *(for all designated States except US)*: **PHARMACIA ITALIA S.P.A.** [IT/IT]; Via Robert Koch, 1.2, I-20152 Milano (IT).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **BORROMEO, Carlo** [IT/IT]; Viale Fulvio Testi, 186, I-20126 Milano (IT).

(74) Agents: **RIPAMONTI, Enrico** et al.; Ing. A. Giambrocono & C. S.R.L., Via R. Pilo, 19/B, I-20129 Milano (IT).

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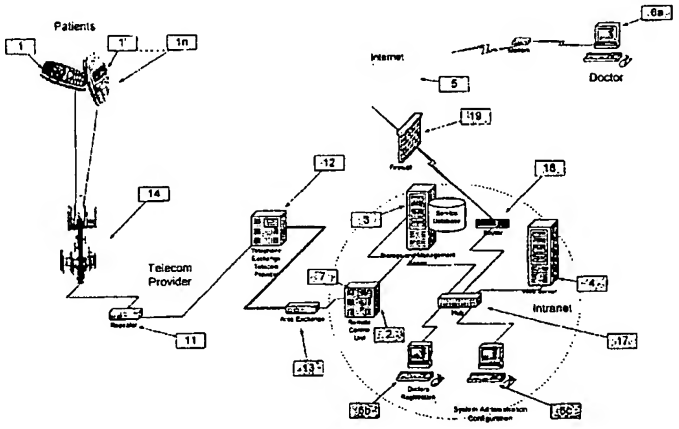

(57) Abstract: A method for monitoring a plurality of persons all presenting at least one common ailment of the human body and subjected to treatment for said ailment, for which treatment at least one individual is responsible, said persons sending to a processing unit (2, 3) at various times a plurality of messages, each comprising at least one code identifying the person and at least one item of data relative to the evolution of said ailment and/or relative to said treatment at a given moment in time, the processing unit (2, 3) sending said messages to a working station (6A) of said responsible individual; in which said plurality of messages comprise at least one group of predefined messages not modifiable by said persons, with each of said predefined messages there being associated at least one predefined personal telephone number corresponding to a predefined personal telephonic access, said messages being sent by each of said persons using his own personal telephonic access and calling the telephone number associated with the predetermined message which he wishes to send.

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METHOD FOR MONITORING A PLURALITY OF PERSONS ALL PRESENTING AT LEAST ONE COMMON AILMENT

The present invention relates a method and a system for automatically monitoring, by at least one doctor, a plurality of patients afflicted with at least one common pathology or subjected to a common medical treatment or clinical trial in accordance with the pre-characterising part of the independent claims.

Said method and system are described hereinafter with reference to the monitoring of patients afflicted with a common pathology and under treatment by a doctor; the system could however also be used to monitor clinical trials. The terms "patients", "pathologies" and "doctor" are hence also to be understood respectively as: "clinical trial participants", "clinical trial" and "clinical trial controller". Likewise the term "pathological" is to be understood in the most general sense as an ailment of the human body able to be cured by treatment of the human body, and the term "doctor" as the person responsible for that treatment.

In known monitoring methods and systems the patients, to communicate their messages, have to interact with vocal forwarding devices and/or make SMS transfers via a cellular phone, e-mails or other similar known methods.

The known methods and systems require on the one hand that the patients possess the particular appliances necessary for the various types of communication (personal computer, internet terminals, cellular phones, palm-held devices) and on the other hand that they know how to use these instruments correctly. It often happens that certain categories of patients, for example the elderly, do not have the necessary familiarity with the aforesaid new communication appliances to be able to use all their potential, or that the economical conditions of the patients do not allow the purchase of such appliances or enable them to be used only for limited periods.

An object of the present invention is to provide an automatic monitoring method and system which can be used easily and quickly by patients at negligible cost while at the same time not involving excessive cost to the service manager.

This and other objects which will be apparent to the expert of the art are

attained by a method and system in accordance with the characterising part of the independent claims.

The present invention will be more apparent from the accompanying drawings, which are provided by way of non-limiting example and in which:

Figure 1 is a schematic view of the components of the system according to the invention;

Figure 2 shows a schematic structure of the data base for implementing the invention;

Figure 3 is a block diagram of a possible processing unit of the system for receiving calls arriving from patients, according to the invention;

Figures 4-9 show possible displays of a program which implements the method of the invention.

The method and system of the invention, using wireless and internet technology, enable a doctor to monitor the therapy of his patient by periodically collecting data which the patient is able to provide using his telephone appliance, preferably cellular, by means of a "ring" (i.e. a simple phone call which will not receive a reply and therefore not a proper telephone connection to a predetermined number).

As described hereinafter, by accessing his own web page the doctor can verify, on the "patient's diary", the progress of the therapy and transmit him precise instructions via SMS or, if considered necessary, by telephone contact.

For greater clarity, the main characteristics of the method and system of the invention will now be described in a general manner, these characteristics then being examined in detail in the present description. According to the invention, the doctor accesses the service via a browser to register the patient, and provides him with a printed list of telephone numbers which the patient has to call to communicate the monitored events (for example the number 339.1356873 for high pain level, the number 378.5874123 for low pain level, etc.). The patient can note these numbers in the agenda of his cellular phone for rapid activation. Other numbers are also indicated in the list: free information numbers, service deactivation numbers, etc. By calling the appropriate numbers the patient periodically communicates with the system to provide the values required by the doctor, and the system stores them. The

telephone call is of zero cost to the patients because the system does not reply to the call but notes that a certain number has been called by a certain appliance, the number of which is automatically determined; immediately after storage, the system disconnects the call. The system stores the calls made by the patient and acquires information regarding the called number and the calling number, and makes them available to the doctor who accesses them via browser (doctor web interface). The system also sends a message to the patient that the recording has occurred; the doctor periodically accesses a web site via browser to display the patient's diary. If he considers it opportune he can communicate with the patient by sending a SMS or he can contact him by telephone.

With reference to Figure 1, for each patient a system according to the invention monitors a telephone appliance 1-1^n able to receive and transmit messages via known telephone network means (repeaters 11, 12 and 13 and antenna 14) from and to a remote control unit 2 connected to a system control and store unit ("Storage and Management Server) 3 connected to a network, in particular to the internet 5, to which a server 4, in particular a web server, and at least one first working station 6a for at least one doctor are connected. The system also comprises at least one second working station 6b for a pharmaceutical informer for registering new doctors, and at least one third working station 6c for the system administrator for configuring pathologies (as described hereinafter). These stations 6b, 6c, the server 4 and the server 3 are connected to a hub 17 connected to a router for internet access. The system of the invention is advantageously protected by a firewall 19. As is usual for the expert of the art the system management unit or server 3 can comprise either a single processor or a plurality of processors distributed within the network, and the doctor working system, the informer and the management unit can be a PC or a remote terminal of other known type connected to the server 4 via internet. According to the invention the messages which the patients can transmit are predefined: for example messages of the type: pain absent, slight pain, moderate pain, strong pain, have taken drug, I request appointment, call me. With each of these predefined messages there is associated a telephone number, for example:

pain absent 0376-28509, slight pain 0376-285095, call me 800-7422225 etc.

All the telephone numbers corresponding to messages are fed to receiver means 7 of the control unit 2, which comprises usual means for tracing all the calls received by said unit, i.e. for noting and storage in a "ReceivedCalls" store 200 (Figure 2) the number of the called line, the number of the calling appliance and the date and time of the call.

It should be noted that the control and tracing means of the unit 2 do not have to establish a true telephone connection with the appliance 1 of the calling patient; according to the invention it is sufficient to determine the fact that a certain telephone number, with which a predetermined message is associated, has been called by a predetermined telephone appliance, of which the telephone number associated with a given patient at a certain date and time is identified. Means for receiving and tracing an actual telephone call in the aforesaid manner without establishing a telephone connection are known and will therefore not be described in detail hereinafter. The control unit 2 comprises a processing unit 100 (indicating a flow diagram representative of the operation of said processing unit) shown schematically in Figure 3, which receives calls arriving from a telephone exchange and stores them in the "ReceivedCalls" store 200, used by the "Storage and Management Server" 3 to trigger appropriate actions provided by the service management. Figure 3 describes at high level the process of receiving a feedback call from a patient: each call received by the control unit 2 on the basis of data present in a "Patients" store 300 and of other data previously stored (as described hereinafter) activates a processing process which, as shown in Figure 3, firstly checks that the calling number corresponds to a telephone number of a stored patient to be monitored, and if positive updates an "EventsLog" store 301 managing the "events" (Figure 2) of a "historical" store of all the "events" of the system, then possibly automatically transmits a message received confirmation to the patient and automatically feeds information to the doctor (block 305). If the calling number does not correspond to that of a stored patient the traced information is not processed and a warning SMS message can be sent to the calling number (block 304).

The processing unit 100 is also connected to usual known means (modem 306

able to dial telephone numbers, SMS gateway 307) for sending to the patients' telephone appliances predetermined messages, such as messages confirming receipt of the message sent by the patient or messages reminding the patient to send a message. These predetermined messages can be of any known type, for example SMS or voice messages. The processing unit 100 is also connected to usual interface means (local area network, cabling and hub) with the server 4 (web server) where the display pages of the patient's diary are filed for the doctor in HTML format.

As shown in Figure 2, the storage means contained in the server 3 provide a cascade data structure, which to store the data relative to each patient comprises the said "Patients" store which contains a code identifying the patient, his first name and surname and the telephone number of the appliance from which the patient sends messages; this store is connected to a "LinkPatientPathology" store 220 containing the patients identification code, the pathology code, and the starting and finishing date of the treatment. It should be noted that with each patient there can be associated a plurality of pathologies, with each of which there corresponds a different "Pathologies" store 290. With each "Pathologies" store 290 there is associated at least one "Events" store 230 comprising information relative to the type of event (for example the patient can provide feedback such as: strong or weak pain, good or poor mobility, or message for the doctor), the frequency with which the event must occur (for example daily or weekly), activation of the automatic function (described hereinafter) by which the system automatically reminds the patients of the need to send the feedback if this has not arrived within the scheduled time, and activation of the automatic function (described hereinafter) by which the system automatically informs the patient of receipt of the sent message.

It should be noted that these automatic "confirmation" and "reminder" functions can be implemented by the system, and in particular by the control unit 2, advantageously by automatically feeding an SMS message, a telephone ring from the patient's telephone appliance or a telephone call, for example in voice synthesis, to the patient's appliance; and that the choice of these options is stored in the "TherapyConfiguration" store 240. It should also be noted that for

each event related to a particular pathology of a particular patient a different "TherapyConfiguration" store 240 is created. To each "Events" store 230 (which contains the description of the standard events associated with the pathology) there is related a "TherapyConfiguration" store comprising the events associated with a particular patient in the light of the pathologies attributed to him. By means of the "DefaultProtocol" store 250 the events are associated initially with the various pathologies, in accordance with predefined procedures. The doctor can display the pre-assigned events for the pathologies associated with the patient and can modify or eliminate one or more events; the final situation of the events associated with a specific patient is stored in the "TherapyConfiguration" store 240. A "LinesConfig" store 260 enables the called telephone numbers to be associated with the individual events which the patients have to dial to indicate the various events. In the "Events" store 230 there is also contained a description of the indicated value associated with the event and the effective associated value (for example the reported pain level or the body temperature). The evaluation of all the events is useful for displaying the indicated events in graphic form. With each "Patients" store 300 there is also associated the "EventsLog" 301 containing the history of all the recorded events and an "Anamnesis" store 270 containing notes inserted by the doctor and the date on which these are inserted. The "EventsLog" store 301 comprises for each received event a patients identifying code, the type of event indicated, its value, the date received and an indication of the pathology. The "Anamnesis" store 270 comprises for each anamnesis a date on which the anamnesis was effected and a note containing the observations of the doctor relative to the evolution of the patient's health situation during therapy.

As in the case of the patients, also for the doctors the storage means provide a "cascade" data structure comprising for each doctor a first "Doctors" store 280 comprising a doctor identification code, his name and sumame and his telephone number; this store is connected to a number of "Patients" stores 300 equal to the number of patients to be monitored. The "Doctors" store 280 can for each doctor also provide further information fields such as the e-mail address of the doctor and the list of pathologies which the doctor is authorized

to monitor. The "Doctors" store 280 can also be connected to one or more "PatientSharing" stores 281 comprising an indication of the "additional" doctor with whom a "main" doctor wishes to share the patients, an indication of the "main" doctor, and a password for enabling this sharing.

To trace the calls received, the control unit 2 comprises the aforesaid "ReceivedCalls" store 200, the "Scheduling" store 285 and the "EventsLog" store. For each telephone call detected by the control unit 2, the "ReceivedCalls" store 200 stores information regarding the telephone number of the line called, the calling telephone number and the date and time of the call.

For each "event", i.e. each message which a patients has to send, the "Scheduling" store 285 stores a patient's identification code, the awaited event, the date on which this event is awaited, and information relative to whether the event has taken place and has been stored.

To activate the system it is necessary firstly to " configure the pathologies" which are to be monitored. This is done by the system manager via the web interface 6c and the connection to a web site accessible only by the system manager and providing suitable screens of a "configuration pathologies" program which:

- inserts a new pathology to be monitored by the system, and connects the generated events related to it – generated and stored in the respective aforesaid "Pathologies", "Events", "DefaultProtocol" and "LinesConfig" stores. This latter store contains the association between event and corresponding telephone number that the patients has to call to indicate it. The events can for example be: patient feedback, reminder for the doctor and notification for the doctor. The "feedback" event is the variable/symptom that the system monitors for the doctor. As a consequence of particular events, the system also enables a notice to be sent to the doctor on the cellular phone (SMS) or in the notifications section of his home page or in his e-mail. The doctor can also be notified, on his cellular phone or on the home page or in this e-mail, to check the patient's file or to arrange a surgery visit. The manager can also add events related to an already existing pathology and configure its monitoring.

To access the described system a doctor must firstly register. This procedure is advantageously managed by an operator agent who via his web interface 6b (Figure 1) accesses via the web a site for registering the doctor, this providing a suitable "register new doctor" program screen accessible only by the system manager and informer and enables the doctor's data required for his registration to be inserted and stored, these being:

- First name and surname
- Mobile phone number
- E-mail address

These data are inserted automatically into the already described "Doctors" store 280 which is accessible only by the system manager.

In configuring the doctor profile the informer can:

- Add, cancel and modify the profile of doctors;
- Select which pathologies, among those previously configured by the system administration, that the doctor can monitor.

Figure 4 shows a possible window of the management program for registering a doctor.

Besides providing for storing the doctor's data in the relative "Doctors" store 280, the control unit 2 sends via e-mail and/or SMS a service access password within 24 hours of registration.

The doctor accesses the service with the sent password and must, when requested by the system, change the password to be able to continue to use it (this ensures non-accessibility to the doctor's pages by third parties). The password must consist of 8 characters of which at least two are numbers.

The system management program comprises a "change your profile" function by which the doctor can change the password, his cellular phone number and his e-mail. The management unit also automatically enables a new password to be inserted on request of the doctor after a predetermined time period, for example 3 months.

Once registered the doctor can access the monitoring service: to do this via his interface 6a the doctor connects to a predetermined site which activates a monitoring program. As its first action this program automatically requests that the doctor keys-in the name by which he has been registered and the

password. The management server 3 checks these data and if correct enables the system program to show a personalized screening for entry to the system, i.e. a personal home page represented in Figure 5.

This home page comprises a welcoming window 51 carrying the name of the doctor, clicking on which results in disconnection from the system, a window 52 containing possible notices, generated automatically by the management server 3 on the basis of particular events generated by the patient (for example that the patient has indicated for several days a high pain threshold) and five windows or icons 53, 54, 55, 56 and 57 for activating the four different functions controllable by the doctor (windows 53-56) and an on-line guide (window 57). The controllable functions are:

- modify doctor profile: by accessing this function the doctor can change the password, his cellular phone number and his e-mail;
- add new patients: enables the doctor's patients to be registered and activate monitoring by indicating the related pathology;
- modify patients profile: he can change the personal data of his patients (cellular phone number, patients identification data and additional data relative thereto, etc.) and personalize pathology monitoring compared with the standard provided;
- display the patients diary: this enables the progress of his patient's pathology and the effects of the relative therapy to be kept under control (including graphically); he can also send SMS messages to his patient.

By activating the "add patients" function, the management server 3 displays the web page 61 shown in Figure 6 by which the doctor can insert data relative to the patient and other additional data.

In the patient's registration file the doctor has available an appropriate descriptive space for inserting a text of his choice, which (as will be described hereinafter) will be printed together with instructions for use by the patient. In this space he can write the diagnosis, the prescription, the posology, indication of the next visit, etc.

In addition to this information, the doctor must insert the date of commencement of therapy and the possible date of termination, and the name of the pathology of his patient.

The management server 3 automatically stores these data in the "Patients" store 300 and the "LinkPatientPathology" store 220. It should be noted that the management server 3 also provides for storing "by default" the events associated with the pathology selected by the doctor for each particular patients. Advantageously, the management server 3 sends to the patient's cellular phone an SMS confirming that registration has taken place.

On activating the "modify profile" function the management server 3 displays a new web page which offers the doctor the ability to access the following further options:

- Configure the events associated with the pathology
- Insert anamnesis notes in the appropriate fields and file them by date
- Display the patient's file
- Enable sharing of the patients file
- Modify the patient's data
- Modify the therapeutic suggestions
- Print the new modifications.

It should be noted that with the "modify patient's profile" function, the doctor can configure the monitoring of the therapy of the individual patient. The configuration modifications are saved only for that specific patient and do not involve configuration changes for other patients.

From the list of patients, the doctor can cancel patients or modify the monitoring configuration by selecting the appropriate icon to the side of the patient's name. The date relative to cancelled patients are retained in the doctor's patient database even if not visible in the service web pages.

A check-box to the side of the patient's name enables the patient's file to be shared with another doctor for reading and writing, at the choice of the doctor who enables the sharing, as explained hereinafter.

With regard to the function relative to modifying the configuration of the events associated with the pathology it should firstly be noted that the management server 3 automatically, as default, associates with each pathology a plurality of predetermined events and the frequency of these events. An example of this configuration is shown in Figure 7 in which the following events are associated with the hyperactive bladder pathology:

- number of daytime urinations, identified by patient feedback, with which a weekly frequency is associated,
- number of night-time urinations, identified by "patient feedback", with which a weekly frequency is associated,
- number of episodes of incontinence, identified by "patient feedback", with which a weekly frequency is associated,
- presence of side effects, identified by "notification to the doctor", with which no frequency is associated,
- patient diary revision, identified by "reminder to the doctor", with which a monthly frequency is associated.

By selecting the event to be reconfigured, for example "number of night-time urinations", access is gained to the configuration page as represented in Figure 8.

The following functions can be modified from the configuration page:

- The frequency of monitoring the event by which the specific pathology symptom is to be monitored (e.g. "number of night-time urinations"). As default, a series of possibilities are presented (e.g. daily, monthly, weekly. etc.); by selecting the clock icon (indicated by an arrow in Figure 8), access can be gained to a detailed configuration and the monitoring frequency can be configured at will, selecting the days of the year on which feedback is required from the patients.
- The facility for sending an SMS reminder message to the patient to remind him to send a feedback to the system.
- The timetable for sending the SMS reminder message.
- The facility for sending an SMS message to the patient as confirmation of receipt of the feedback.
- The facility for the system to send a confirmation ring to the patient, to which he does not have to reply. – The text of the message to the patient confirming reception (for example: "thanks for communicating your pain level").
- The facility to inform the doctor by an SMS to his cellular phone or e-mail, of the event recorded by the system.
- The facility to configure the frequency and timetable with which the system reminds, via SMS, e-mail or home page, that the patient's diary should be

checked.

The changes made are saved by selecting the "confirm planning" key.

If the event "remind the doctor" is to be reconfigured, the manner in which the doctor is advised of particular patient feedbacks, such as the presence of side effects, can be configured.

The following functions can be modified:

- Message to the patient confirming reception of the call made by him.
- The text of that message.
- The facility to receive an SMS on his cellular phone with the value communicated by the patient.
- The facility to receive a message on his home page.
- The facility to receive a message by e-mail.

To insert new anamnesis notes in the appropriate fields of the patient's file and to file them by date, the procedure is as follows: the doctor inserts the note to be stored in the appropriate field "insert new note" and confirms by clicking on "insert note". The system automatically stores the note and the date and time of transmission. The doctor can also access the past history of the inserted notes by clicking on the "historical" icon.

To display a patient's file the doctor can access the patient's file in two ways:

- from the doctor's personal page, he clicks on the "patient's diary" icon; the doctor then finds a patients list and accesses the patient's file by clicking on that concerned;
- from the "modify patient profile" function (already described), he clicks on the "patient's diary" window or icon 56; the doctor then finds a patients list and accesses the patient's file by clicking on that concerned;
- from the "modify patient profile" function (window 53) (already described), he clicks on the "display diary" icon.

If the doctor wishes to share the file of his own patient with another doctor, from the function "modify patient profile" the doctor clocks on a check box provided to the side of each patient. In this manner the management server 3 automatically sends to the patient and/or doctor, via SMS, a code to be sent to the doctor with whom he wishes to share the file, enabling this latter to access it after inserting it into a suitable field. The doctor may have only writing or

reading access to the patient's file at the discretion of the doctor who allows the file to be shared.

On de-selecting the check box of the relative patient, the file will no longer be shared by the doctor.

If the doctor wishes to modify the patient's data (for example his cellular phone number) and/or modify the therapeutic suggestions he acts in the following manner: the doctor modifies the patient's data by clicking the "modify patient profile" icon on his home page (window 55); he then selects the patient for whom he wishes to modify the data and accesses the patient profile modification screen, where he can modify his data inserted in the appropriate fields, then confirm by the "confirm" icon.

To modify therapeutic suggestions, the doctor operates in the aforedescribed manner, modifying the text of the therapeutic suggestion and confirming with the "confirm" icon.

If however the doctor chooses on his home page the "display patient's diary" option (window 56), the management server 3 firstly shows the doctor a list of his patients. From this list the doctor selects the patient for whom he wishes to examine the diary.

On the web page (Figure 8) displaying the patient's diary, the doctor will find:

- the last 10 events for which the doctor has configured the display on his home page. The doctor can access the historical archive of the events and highlights generated in the past;
- a graph displaying the progress of the determinations effected by the system with time. The doctor can change at will the type of graph to be displayed (bar graph. line graph. etc.) and the time interval for displaying the patient's events. The doctor can also display a single event or several events simultaneously;
- a field into which to insert a text and send an SMS to the patients) e.g. please call me). The doctor can also access the archive of all SMS's sent by the system to the patient and by the doctor to the patient, with searching by date or by contained text;
- a list of the last 10 events monitored by the system.

The doctor can access the historical archive of all the events/symptoms associated with the patient, with searching by date and value of a particular

event/symptom (for example a search for all events corresponding to medium pain level from 1/1/02 to 1/5/02) and

- a list of the anamnesis notes. The doctor can access the historical archive of all the anamnesis notes.

The doctor can:

- print the patient's file
- unload the file data into a file in word and/or excel format.

It should be noted that by transforming into a patient monitoring graph, the doctor's evaluations are simplified and accelerated in particular with regard to determining whether the patients has exceeded threshold values.

From his home page the doctor can also activate the "print instructions" function by which an instruction sheet personalized for each patient is printed automatically by a printer connected to the doctor's PC.

This sheet advantageously contains information relative to:

- the type of pathology monitored, for example osteoarthrosis,
- the telephone number of the patient enabled to use the monitoring system,
- the patient's personal data recorded by the system and a patient identification number assigned by the system.
- a series of telephone numbers, preferably free numbers, for requesting information, for knowing the last symptom/event communicated, for cancelling the last symptom/event communicated, for deactivating the monitoring service,
- the notes inserted by the treating doctor for each patient (for example take drug XX every day, determine pain level and mobility every week and fix next appointment for six months).

The sheet given to the patient also contains a summary of the operations to be carried out to monitor the therapy, for example:

"Communicating pain level:

Every two weeks, dial the telephone number corresponding to the pain intensity noted by you during the course of the day."

* > Pain Absent	- 0376 28 50 94
* > Pain Slight	- 0376 28 50 95
* > Pain Moderate	- 0376 28 50 96
* > Pain Strong	- 0376 28 50 97

Communicating mobility level

Once every two weeks dial the telephone number corresponding to your level of articular mobility:

* > Mobility Good - 0376 28 50 91

* > Mobility Poor - 0376 28 50 92

* > Mobility Absent - 0376 28 50 93"

The sheet given to the client also contains a series of further telephone numbers for communicating other types of event; for example:

800-742-6565 - Drug Taken

800-742-4357 - Information

800-742-5278 - Last indication

800-742-2255 - Request Appointment

800-742-2225 - Please call me"

Finally it should be noted that the embodiment described up to this point could comprise numerous modifications all included within the same inventive idea. For example, the mechanism for detecting messages sent by the patient could be in the form of usual automatic responder means which guide the patient in indicating the event by suitable voice messages which enable the determined value or values to be inserted by the telephone keypad. The management server 3 (Figure 2) connected to the responder means when data acquisition is complete then stores the received facts in suitable stores structured in similar manner to that previously described.

CLAIMS

1. A method for automatically monitoring by at least one doctor a plurality of patients afflicted with at least one ailment of the human body and subjected to treatment for said ailment, for which treatment at least one individual is responsible, said persons sending to a processing unit (2, 3) at various times a plurality of messages, each comprising at least one code identifying the person and at least one item of data relative to the evolution of said ailment and/or relative to said treatment at a given moment in time, the processing unit (2, 3) sending said messages to a working station (6A) of said responsible individual; characterised in that said plurality of messages comprises at least one group of predefined messages not modifiable by said persons, with each of said predefined messages there being associated at least one predefined personal telephone number corresponding to a predefined personal telephonic access, said messages being sent by each of said persons using his own personal telephonic access and calling the telephone number associated with the predetermined message which he wishes to send.

2. A method as claimed in claim 1, characterised by receiving the sent messages by merely determining the fact that one of said predefined numbers corresponding to a predefined message has been called and noting the calling number, without replying to the telephone call.

3. A method as claimed in claim 2, characterised by verifying that the calling number corresponds to one of the numbers associated with the persons to be monitored and storage the called and calling number only if this verification is positive.

4. A method as claimed in claim 1, characterised by associating at least the date of its receipt with each noted call to one of said predefined numbers corresponding to a predefined message.

5. A method as claimed in claim 1, characterised in that for each received message the processing unit (2, 3) processes the message by consulting an appropriate store (300, 290, 230, 240) in which each of the predefined numbers is associated with the relative message and with each of the personal numbers there is associated the respective personal name.

6. A method as claimed in claim 5, characterised in that the processing unit

(2, 3) transmits the processed message via a network (5) at least to one station (6A), connected to said network, of the individual responsible for the treatment.

7. A method as claimed in claim 6, characterised in that the network is the internet.

8. A method as claimed in claim 6, characterised in that the transmission takes place via a server (4).

9. A method as claimed in claim 8, characterised in that the sever is a web server (4) comprising at least one web page arranged to manage the display of the messages sent.

10. A method as claimed in claim 1, characterised by comprising a procedure for registering a person to be monitored in which a predefined series of messages which said person must send with a predefined frequency is automatically associated with each patient on the basis of a particular ailment.

11. A method as claimed in claim 10, characterised in that said registration takes place via a web interface (6A) of the individual responsible for the treatment, by compiling at least one web page.

12. A method as claimed in claim 1, characterised by generating for each person a structure of stores (220, 2230, 2420, 250, 260, 290, 300) connected together in cascade, in which a first store (300) comprises data identifying a person presenting an ailment and the telephone number of his personal telephonic access, at least one second store (220) connected to the first and comprising data identifying the ailment of said person, at least one third store (240) connected to the second (220) and comprising data relative to a predefined message that said person must send and to the sending frequency, and at least one fourth store (260) connected to said at least one third store (240) and comprising data relative to the telephone number associated with the message contained in the third store.

13. A method as claimed in claim 12, characterised in that to the first store (300) of each patient there is connected at least one first further historical store (301) comprising data relative to the messages sent.

14. A method as claimed in claim 12, characterised in that to the first store

(300) of each patient there is connected at least one second further historical store (270) comprising the data relative to all the anamneses developed for each person presenting an ailment.

15. A method as claimed in claim 1, characterised by chronologically storing all the messages sent by each patient.

16. A method as claimed in claim 1, characterised by chronologically storing all the anamneses of each patient.

17. A method as claimed in claim 1, characterised by automatically sending to the patient who has sent a message a confirmation of receipt for each message received by the processing unit (2, 3).

18. A method as claimed in claim 10, characterised by automatically sending a reminder message if the patient does not send one or more messages with the predefined frequency.

19. A method as claimed in claim 1, characterised in that the individual responsible for the treatment can consult the messages and can send messages to the persons subjected to treatment by connecting to a web site.

20. A method as claimed in claim 1, characterised by enabling the individual responsible for the treatment to personalize for each patient the type and/or frequency of the messages that the persons subjected to treatment must send to said responsible individual and/or the timetable for sending reminder messages and/or the sending of a message confirming receipt of the message sent.

21. A method as claimed in claim 1, characterised in that the persons subjected to treatment send with predefined frequency messages relative to a quantitative evaluation of one of the symptoms related to the ailment, the processing unit (21, 3) automatically processing graphically said quantitative evaluations and displaying them on a graph selectable on an internet site accessible by the individual responsible for the treatment, said graph being updated for each patient on each receipt of said quantitative messages.

22. A system for monitoring a plurality of persons all presenting at least one common ailment of the human body and subjected to treatment for said ailment, in which each of said persons presents his own device ($1 - 1^n$) for communicating to a processing unit (2, 3) at various times a plurality of

messages, each comprising at least one code identifying the person and at least one item of data relative to the evolution of said ailment and/or relative to said treatment at a given moment in time, the processing unit (2, 3) comprising means (4, 5) arranged to said messages to a working station (6A) of said responsible individual; characterised in that said plurality of messages comprises at least one group of predefined messages not modifiable by said persons, with each of said predefined messages there being associated at least one predefined personal telephone number, with each of said communication devices (1-1^n) there being associated a predefined telephone number corresponding to a personal telephonic access, said devices being arranged to send said messages by using only the predefined telephonic access and calling the telephone number associated with the predefined message to be sent.

23. A system as claimed in claim 22, characterised in that the processing unit (2, 3) comprises means (7) for receiving the sent messages and for noting merely the fact that one of said predefined numbers corresponding to a predefined message has been called and the calling number, without replying to the telephone call.

24. A system as claimed in claim 23, characterised in that the processing unit (2, 3) comprises means (200) to verify if the calling number corresponds to one of the numbers associated with the communication devices (1 – 1^n) of one of the persons to be monitored and to store the called and calling number only if this verification is positive.

25. A system as claimed in claim 22, characterised by comprising means for associating at least the date of its receipt with each noted call to one of said predefined numbers corresponding to a predefined message.

26. A system as claimed in claim 22, characterised in that the processing unit (2, 3) comprises processing means which for each received message processes the received message by consulting a store (230, 240, 260, 300) in which each of the predefined numbers is associated with the relative message and with each of the personal numbers there is associated the respective name.

27. A system as claimed in claim 26, characterised in that the processing

unit (2, 3) comprises means (4, 301) for transmitting the processed message via a network (5) at least to one station (6A) of the individual responsible for the treatment, which is connected to said network.

28. A system as claimed in claim 27, characterised in that the network is the internet (5).

29. A system as claimed in claim 27, characterised in that the transmission takes place via a server.

30. A system as claimed in claim 29, characterised in that the sever is a web server (4) comprising at least one web page arranged to manage the display of the messages sent.

31. A system as claimed in claim 22, characterised by comprising means (6A) for registering a person to be monitored, by which a predefined series of messages which said person must send with a predefined frequency is automatically associated with each patient on the basis of a particular ailment.

32. A system as claimed in claim 31, characterised in that said registration means act via a web interface (6A) of the individual responsible for the treatment, who compiles at least one web page.

33. A system as claimed in claim 22, characterised by comprising for each person a structure of stores connected together in cascade, in which a first store (300) comprises data identifying a person presenting an ailment and the telephone number of his personal telephonic access, at least one second store (220) connected to the first and comprising data identifying the ailment of said person, at least one third store (240) connected to the second (220) and comprising data relative to a predefined message that said person must send and to the sending frequency, and at least one fourth store (260) connected to said at least one third store (240) and comprising data relative to the telephone number associated with the message contained in the third store.

34. A system as claimed in claim 33, characterised in that to the first store (300) of each patient there is connected at least one first further historical store (301) comprising data relative to the messages sent.

35. A system as claimed in claim 33, characterised in that to the first store (300) of each patient there is connected at least one second further historical store (270) comprising the data relative to all the anamneses developed for

each person presenting an ailment.

36. A system as claimed in claim 22, characterised by comprising means (301) for chronologically storing all the messages sent by each patient.

37. A system as claimed in claim 22, characterised by comprising means (270) for chronologically storing all the anamneses of each patient.

38. A system as claimed in claim 22, characterised by comprising means (306, 307) for automatically sending to the patient who has sent a message a confirmation of receipt for each message received by the processing unit (2, 3).

39. A system as claimed in claim 31, characterised by comprising means (306, 307) for automatically sending a reminder message if the patient does not send one or more messages with the predefined frequency.

40. A system as claimed in claim 22, characterised by comprising a web site consultable by the individual responsible for the treatment in order to consult the messages and/or send messages to the persons subjected to treatment.

41. A system as claimed in claim 22, characterised by comprising means enabling the individual responsible for the treatment to personalize for each patient the type and/or frequency of the messages that the persons subjected to treatment must send to said responsible individual and/or the timetable for sending reminder messages and/or the sending of a message confirming receipt of the message sent.

42. A system as claimed in claim 22, characterised in that the persons subjected to treatment send with predefined frequency messages relative to a quantitative evaluation of one of the symptoms related to the ailment, means being provided to automatically process graphically said quantitative evaluations and displaying them on a graph selectable on an internet site accessible by the individual responsible for the treatment, said graph being updated for each patient on each receipt of said quantitative messages.

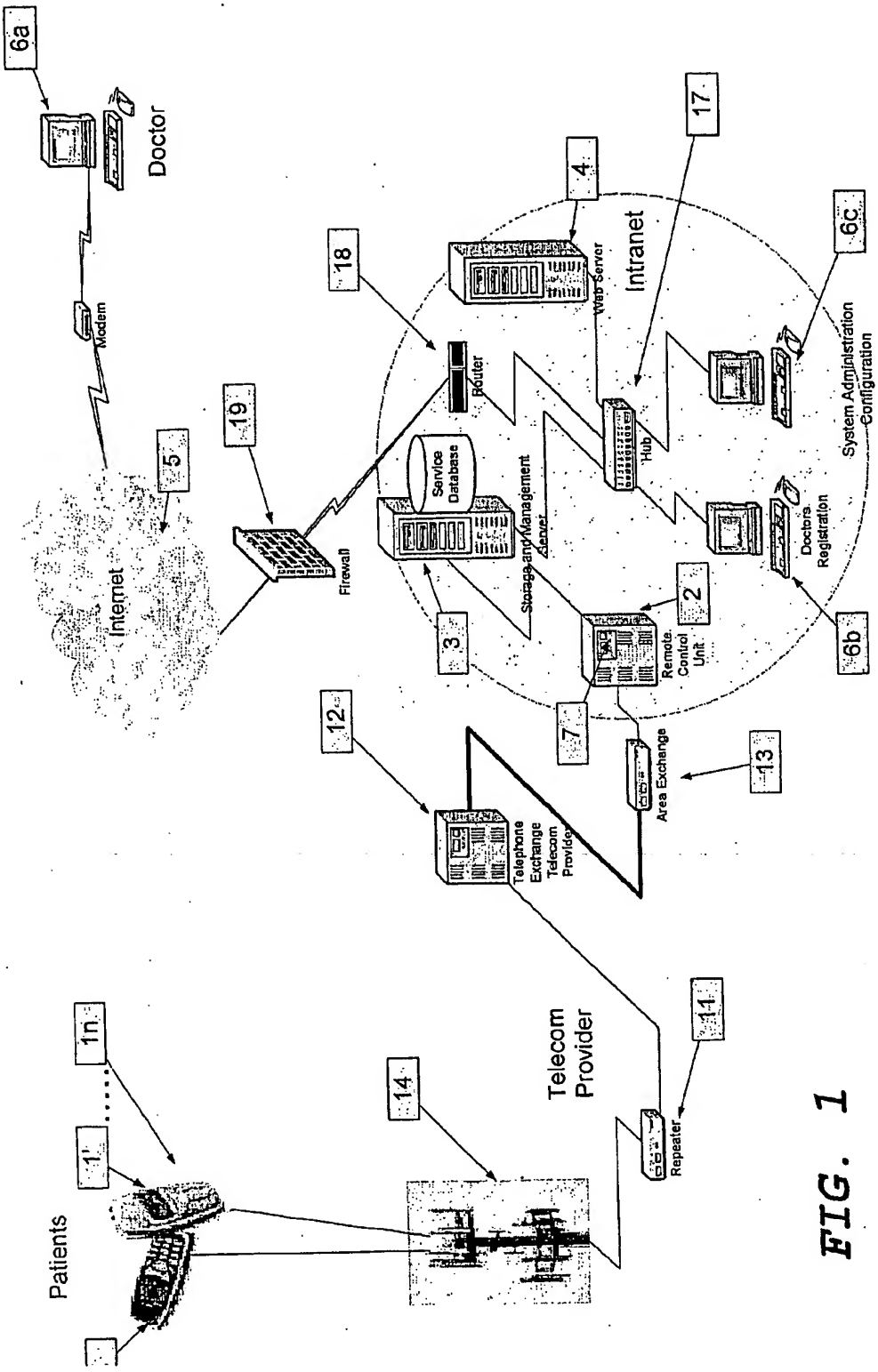
6a
Doctor
Modem
Internet
5
19
Firewall
18
Router
Service Database
Storage and Management Server
3
4
Web Server
Intranet
17
Hub
6c
System Administration Configuration
Doctors Registration
6b
2
Remote Control Unit
7
12
Telephone Exchange Telecom Provider
Area Exchange
13
Telecom Provider
11
Repeater
14
Patients
1n
1'
1

FIG. 1

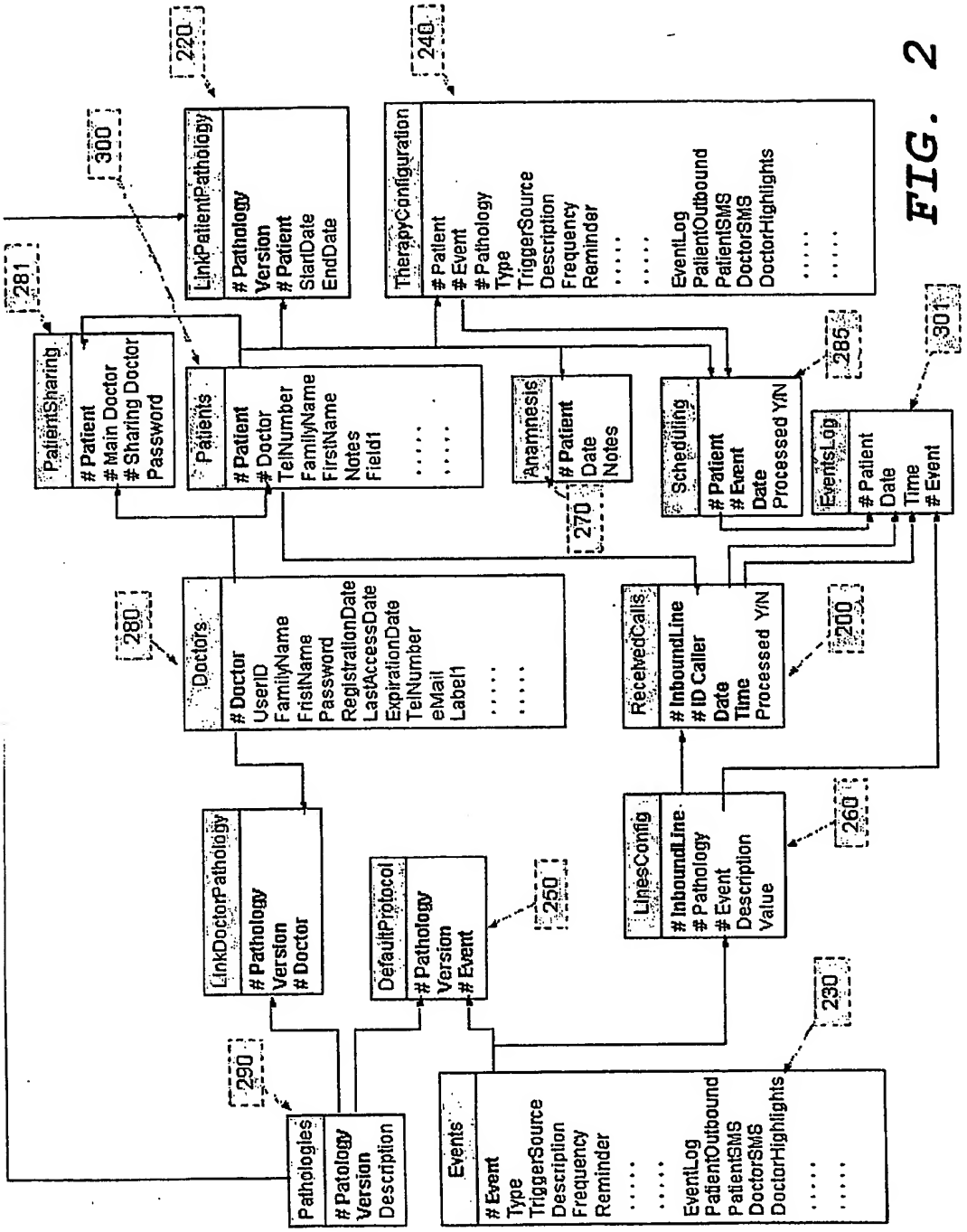
220
240
300
281
LinkPatientPathology
Pathology
Version
Patient
StartDate
EndDate
TherapyConfiguration
Patient
Event
Pathology
Type
TriggerSource
Description
Frequency
Reminder
.....
.....
EventLog
PatientOutbound
PatientSMS
DoctorSMS
DoctorHighlights
.....
.....
PatientSharing
Patient
Main Doctor
Sharing Doctor
Password
Patients
Patient
Doctor
TelNumber
FamilyName
FirstName
Notes
Field1
.....
.....
Anamnesis
Patient
Date
Notes
270
Scheduling
Patient
Event
Date
Processed Y/N
285
EventsLog
Patient
Date
Time
Event
301
280
Doctors
Doctor
UserID
FamilyName
FristName
Password
RegistrationDate
LastAccessDate
ExpirationDate
TelNumber
eMail
Label1
.....
.....
ReceivedCalls
InboundLine
ID Caller
Date
Time
Processed Y/N
200
LinkDoctorPathology
Pathology
Version
Doctor
DefaultProtocol
Pathology
Version
Event
250
LinesConfig
InboundLine
Pathology
Event
Description
Value
260
290
230
Pathologies
Patology
Version
Description
Events
Event
Type
TriggerSource
Description
Frequency
Reminder
.....
.....
EventLog
PatientOutbound
PatientSMS
DoctorSMS
DoctorHighlights
.....
.....

FIG. 2

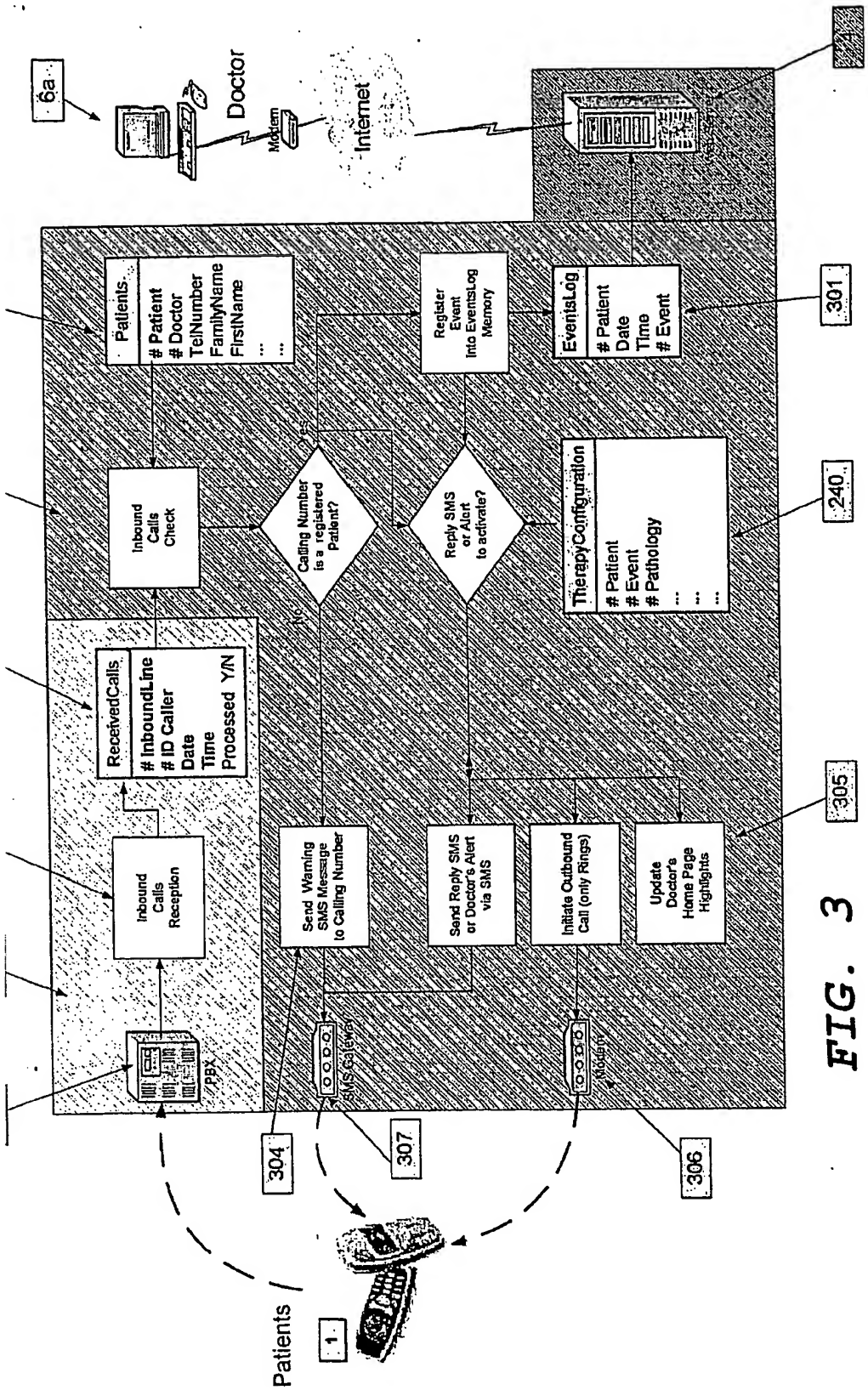
6a
Doctor
Modem
Internet
24
Patients
Patient
Doctor
TelNumber
FamilyName
FirstName
...
...
Register Event Into EventsLog Memory
EventsLog
Patient
Date
Time
Event
301
Inbound Calls Check
Calling Number is a registered Patient?
Reply SMS or Alert to activate?
TherapyConfiguration
Patient
Event
Pathology
...
...
...
240
ReceivedCalls
InboundLine
ID Caller
Date
Time
Processed Y/N
Inbound Calls Reception
Send Warning SMS Message to Calling Number
Send Reply SMS or Doctor's Alert via SMS
Initiate Outbound Call (only Rings)
Update Doctor's Home Page Highlights
305
PBX
SMS Gateway
Modem
304
307
306
Patients
1

FIG. 3

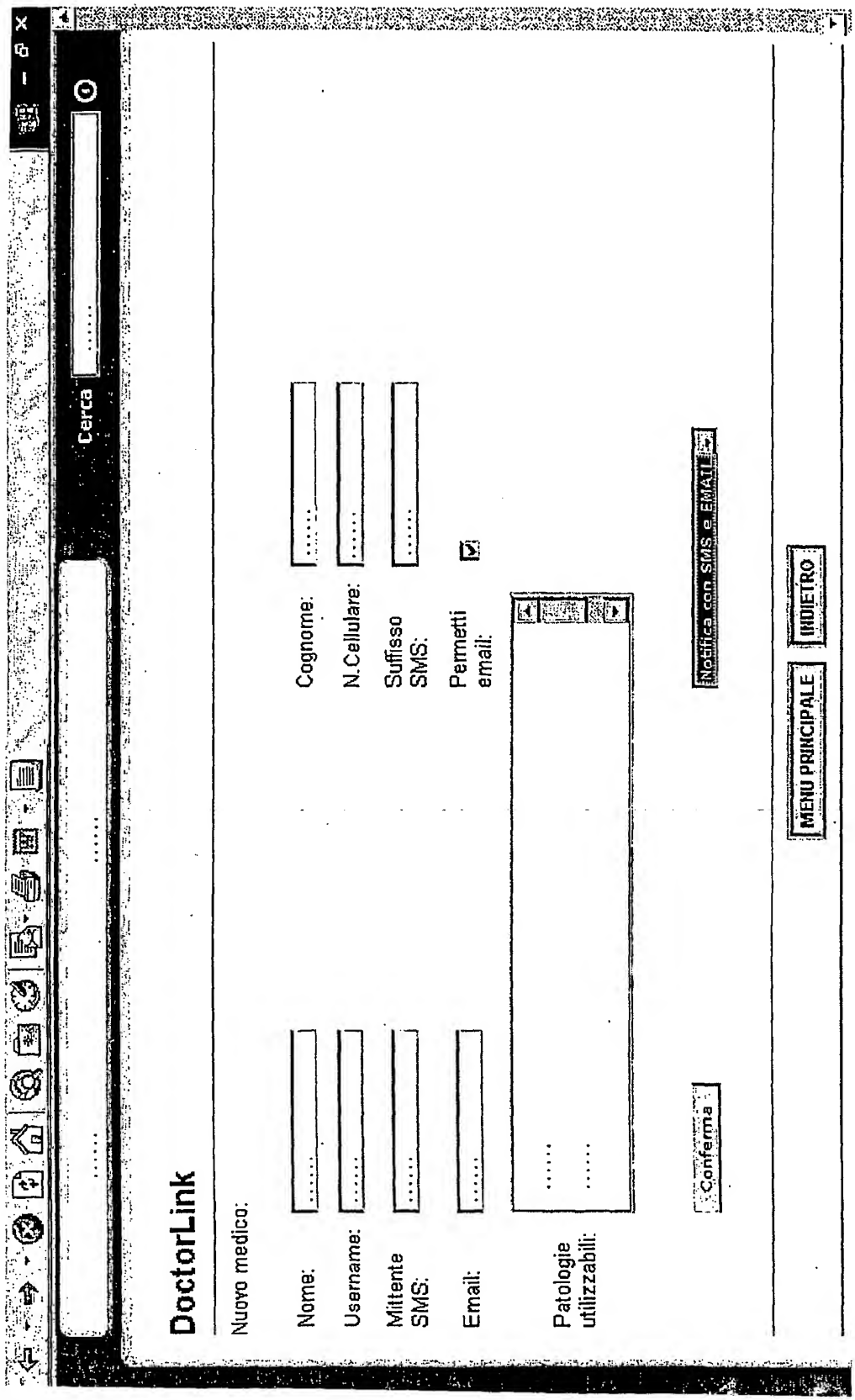
DoctorLink
Cerca
Nuovo medico:
Nome:
Cognome:
Username:
N.Cellulare:
Mittente SMS:
Suffisso SMS:
Email:
Permetti email:
Patologie utilizzabili:
Conferma
Notifica con SMS e EMAIL
MENU PRINCIPALE
INDIETRO

FIG. 4

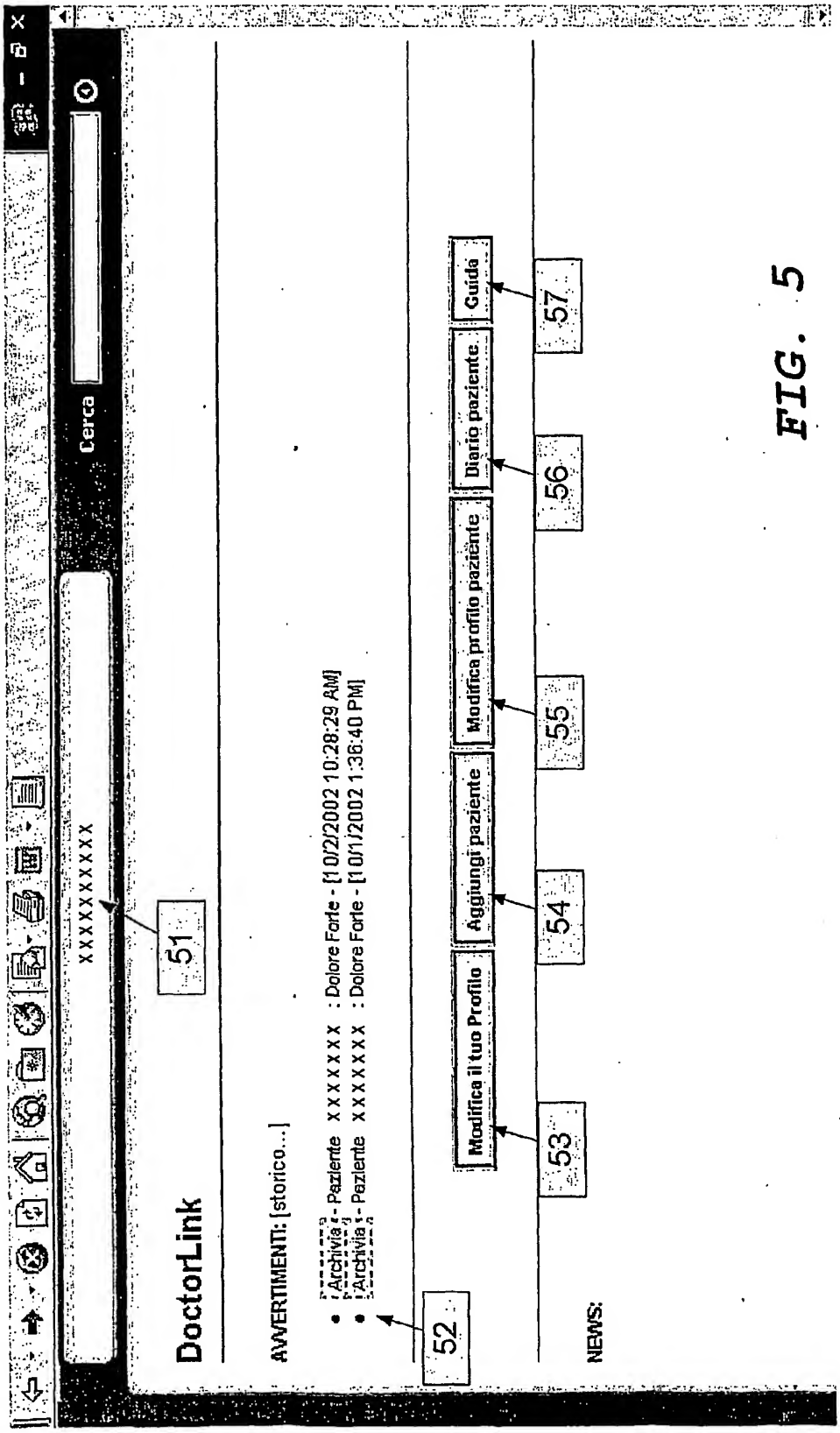
DoctorLink
Cerca
XXXXXXXXXX
51
AVVERTIMENTI: [storico...]
Archivia - Paziente XXXXXXX : Dolore Forte - [10/2/2002 10:28:29 AM]
Archivia - Paziente XXXXXXX : Dolore Forte - [10/1/2002 1:36:40 PM]
52
Modifica il tuo Profilo
Aggiungi paziente
Modifica profilo paziente
Diario paziente
Guida
53
54
55
56
57
NEWS:

FIG. 5

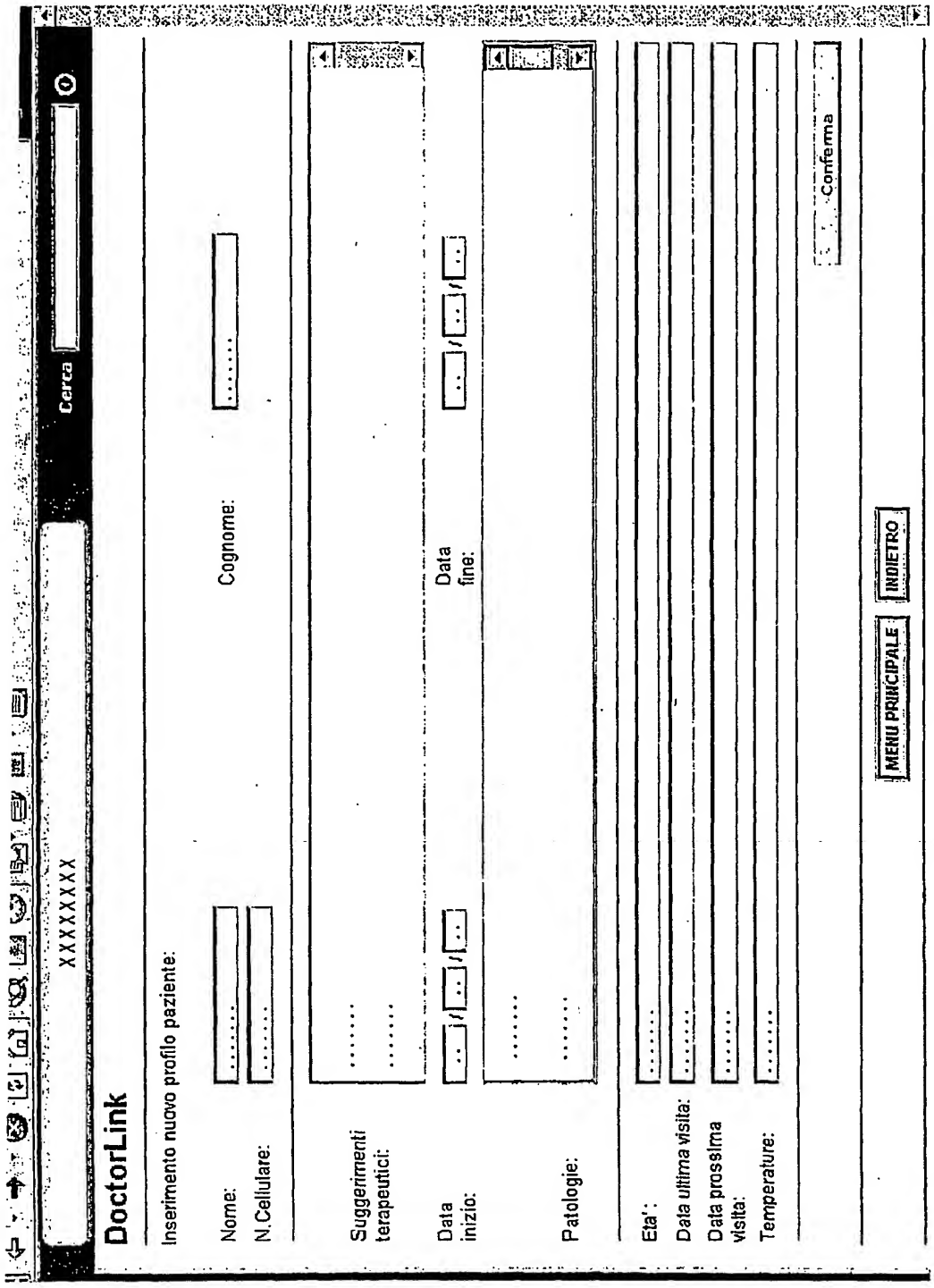
XXXXXXXX
Cerca
DoctorLink
Inserimento nuovo profilo paziente:
Nome:
Cognome:
N.Cellulare:
Suggerimenti terapeutici:
Data inizio:
Data fine:
Patologie:
Eta':
Data ultima visita:
Data prossima visita:
Temperature:
Conferma
MENU PRINCIPALE
INDIETRO

FIG. 6

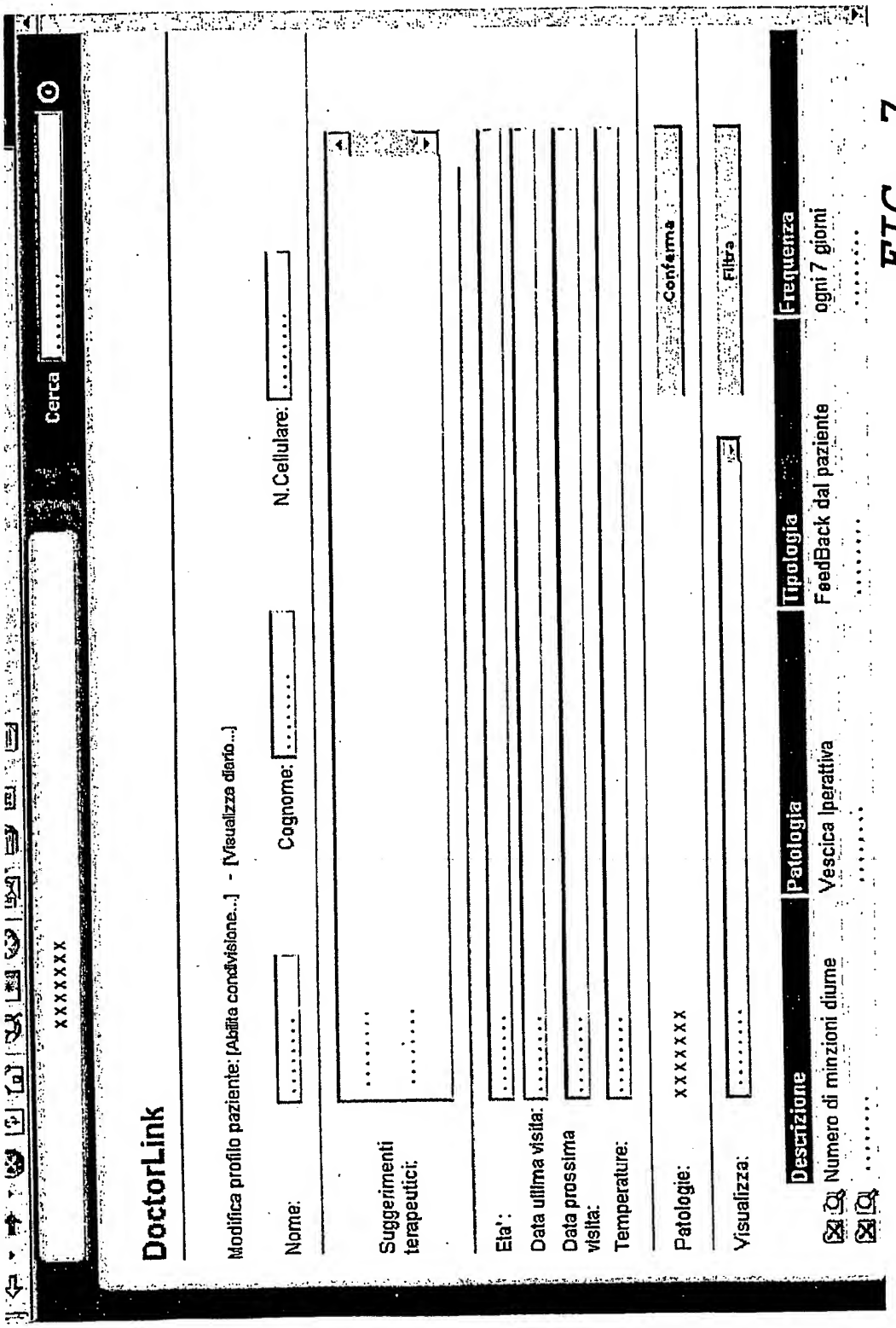
DoctorLink
Cerca
Modifica profilo paziente: [Abilita condivisione...] - [Visualizza diario...]
Nome:
Cognome:
N.Cellulare:
Suggerimenti terapeutici:
Eta':
Data ultima visita:
Data prossima visita:
Temperature:
Patologie:
Visualizza:
Conferma
Filtra
Descrizione
Patologia
Tipologia
Frequenza
Numero di minzioni diurne
Vescica Iperattiva
FeedBack dal paziente
ogni 7 giorni

FIG. 7

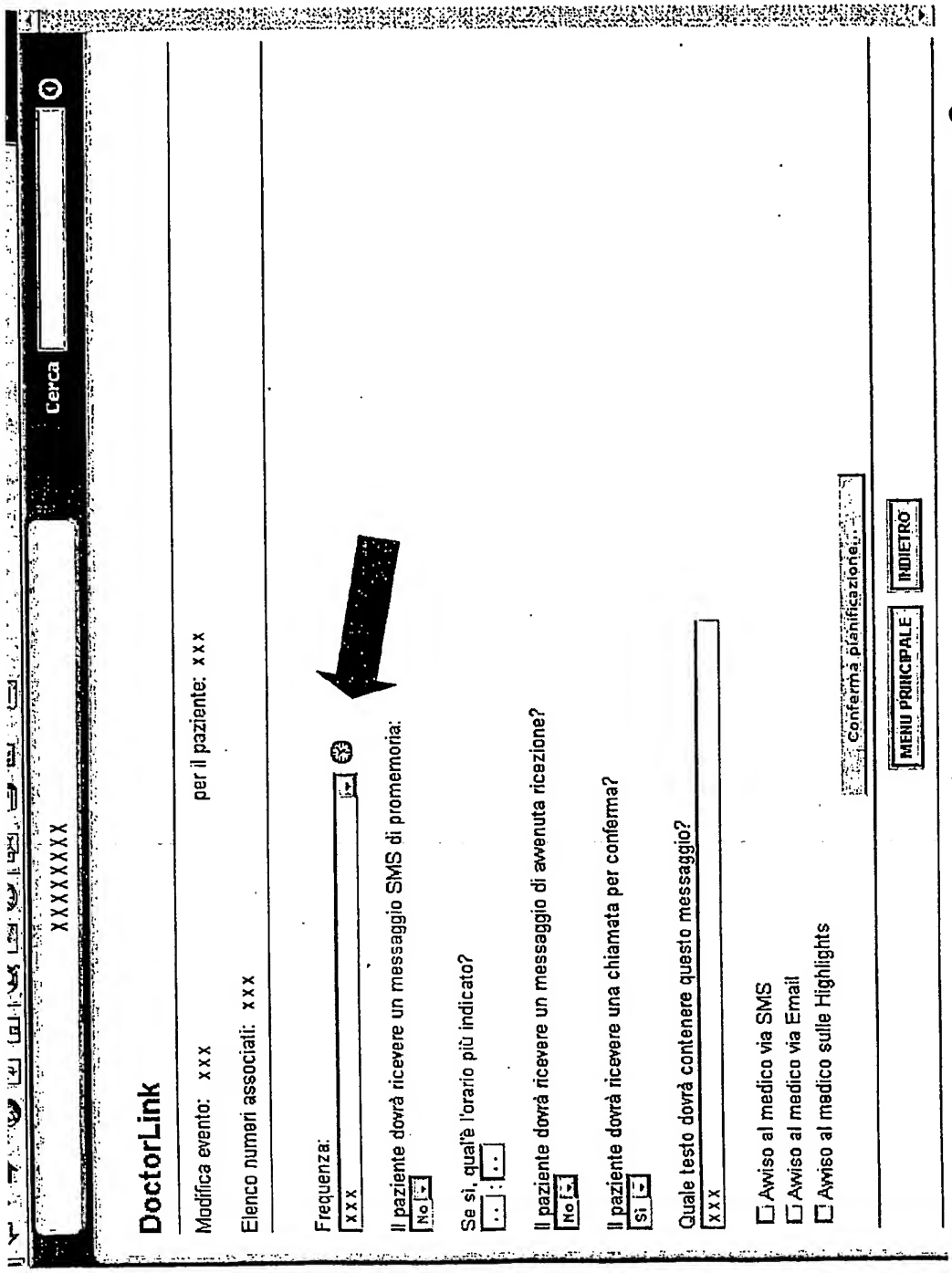
XXXXXXXX
Cerca
DoctorLink
Modifica evento: xxx
per il paziente: xxx
Elenco numeri associati: xxx
Frequenza:
xxx
Il paziente dovrà ricevere un messaggio SMS di promemoria:
No
Se sì, qual'è l'orario più indicato?
: :
Il paziente dovrà ricevere un messaggio di avvenuta ricezione?
No
Il paziente dovrà ricevere una chiamata per conferma?
Sì
Quale testo dovrà contenere questo messaggio?
xxx
Avviso al medico via SMS
Avviso al medico via Email
Avviso al medico sulle Highlights
Conferma pianificazione
MENU PRINCIPALE
INDIETRO

FIG. 8

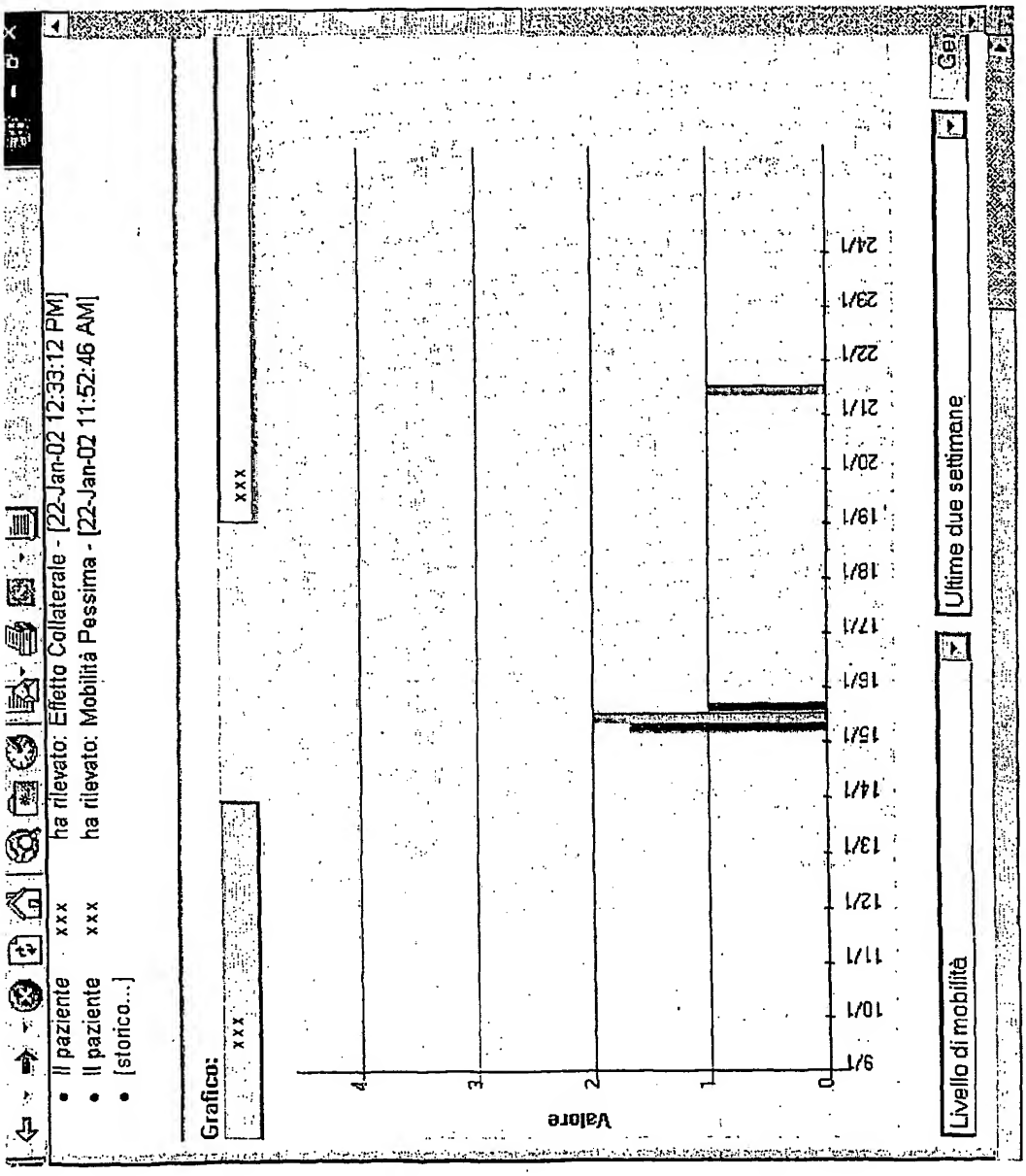
Il paziente xxx ha rilevato: Effetto Collaterale - [22-Jan-02 12:33:12 PM]
Il paziente xxx ha rilevato: Mobilità Pessima - [22-Jan-02 11:52:46 AM]
[storico...]
Grafico:
xxx
xxx
Valore
0
1
2
3
4
9/1
10/1
11/1
12/1
13/1
14/1
15/1
16/1
17/1
18/1
19/1
20/1
21/1
22/1
23/1
24/1
Livello di mobilità
Ultime due settimane
Ge

FIG. 9